Eastern Short-Horned Lizard

MULTISAR

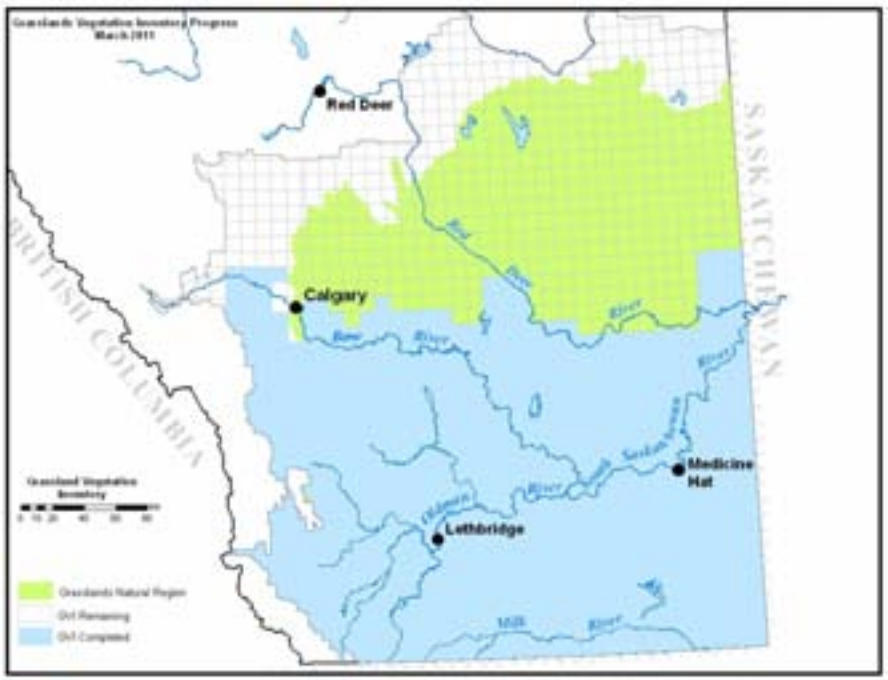
Using Grassland Vegetation Inventory Data

RESOURCE SELECTION FUNCTION DEVELOPMENT

Government of Alberta

Rangeland Conservation Service Ltd.

WHAT IS THE GRASSLAND VEGETATION INVENTORY (GVI)?



GVI progress to January 2011

- The GVI represents the Government of Alberta's comprehensive biophysical, anthropogenic and land-use inventory of the province's grassland natural region.
- Information for the GVI project will be collected for the entire area regardless of jurisdiction including the foothills grasslands (water bodies, native or natural areas, and agricultural, urban and other anthropogenic areas).

WHAT IS THE GRASSLAND VEGETATION INVENTORY (GVI)?

Site Type Examples

- GVI data is captured as polygons, lines, and points in a geodatabase that provides information on a number of different landscape features.
- These landscape features or “Site Types” can also be thought of as different habitat types.
- MultiSAR has used this to identify potential habitat for species at risk.

WHAT IS MULTISAR?

- Multiple Species at Risk (MULTISAR)
- The MULTISAR conservation program is a cooperative initiative between the Alberta Conservation Association (ACA), Alberta Sustainable Resource Development (ASRD), and the Prairie Conservation Forum (PCF)
- MULTISAR collaborates with landholders to maintain and enhance species at risk habitat in Alberta's Grassland Natural Region
- MULTISAR utilizes cost-effective tools to help conserve species at risk

Website
www.multisar.ca

Funding Partners

Canada
The Government of Canada
Habitat Stewardship Program
for Species at Risk

Canadian Natural
Delivering the Future

ALTALINK

GREATER SHORT-HORNED LIZARD

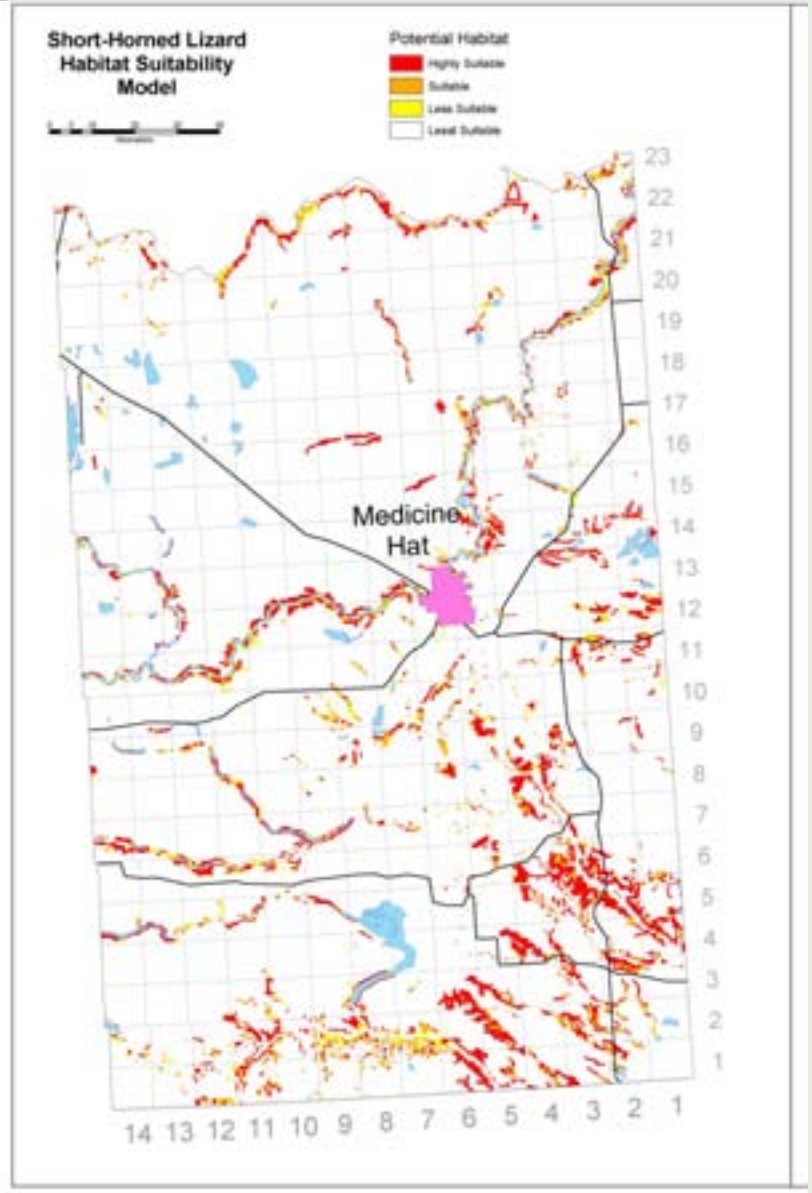
- The only lizard to occur in Alberta
- Approximately 40 mm to 70 mm in length
- Named for the horn-like scales at the back of the head
- Occurs only in the southeast corner of the province
- Found in badland habitat and associated sparsely vegetated coulee slopes
- Number of subpopulations appears to be decreasing, although individual subpopulations appear to be stable
- Legislated as endangered in the province, meaning it might be headed toward extirpation

Young of the year are only the size of a penny

HABITAT SUITABILITY INDEX MODEL

- Original HSI model for the short-horned lizard was developed along with a suite of models for other species to assist MULTISAR in prioritizing areas to focus stewardship activities.
- Original model was based on a literature review and expert opinion
- Model contained 4 variables:
  - Topographical features - distance to valley
  - Native Prairie Class
  - Elevation
  - Riparian Zones
- Mapped at the quarter section level

HSI MODEL


Short-Horned Lizard
Habitat Suitability
Model
Potential Habitat
Highly Suitable
Suitable
Less Suitable
Least Suitable
Medicine
Hat
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RESOURCE SELECTION FUNCTION

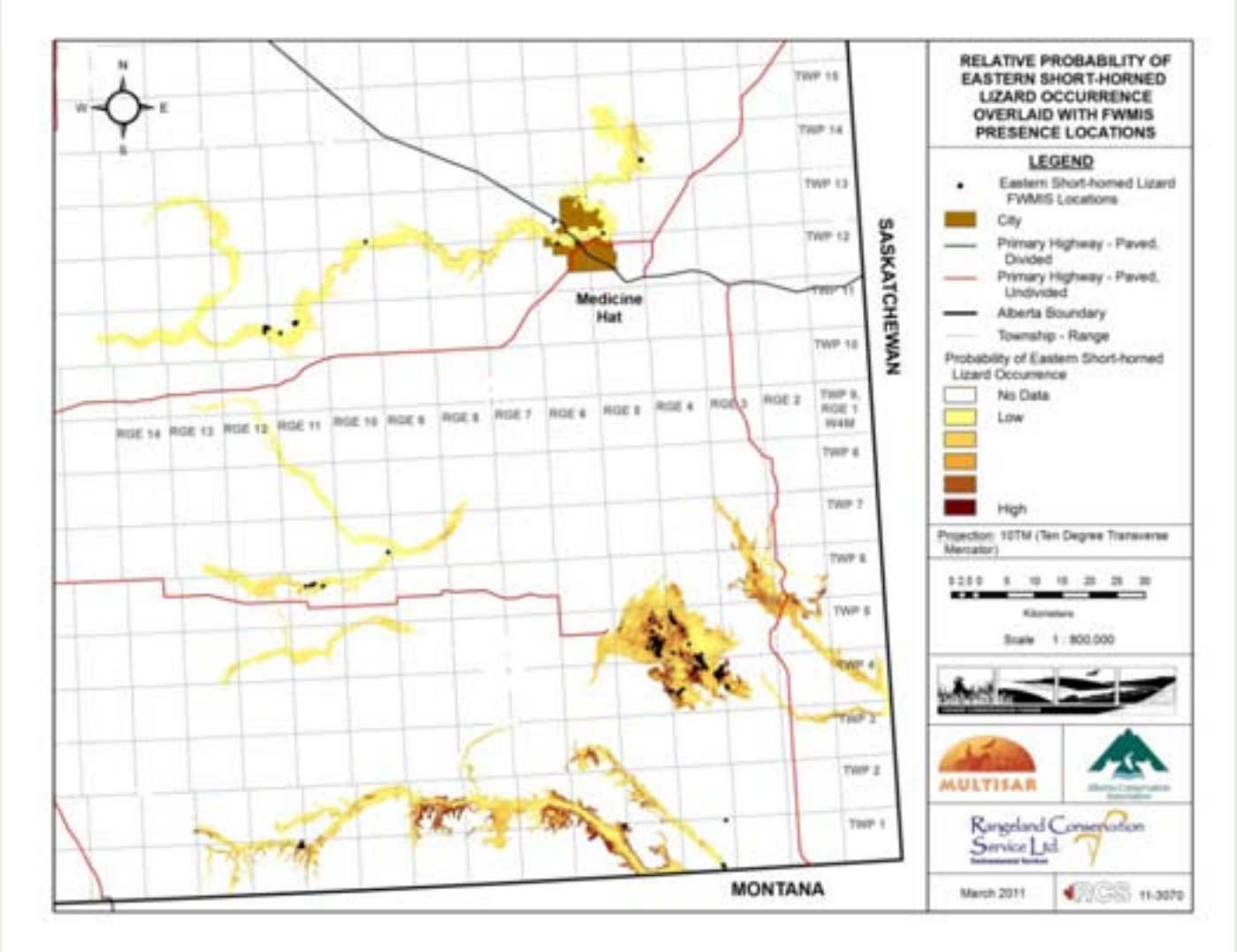
- Resource selection functions (RSFs) are a conservation tool being utilized by MULTISAR as an alternative to Habitat Suitability Index (HSI) models.
- Where resources are defined as any abiotic or biotic factor directly used by an organism (Morrison 2002), a RSF is defined as a function (*i.e.*, statistical model) that estimates the probability of use of a resource (Manly *et al.* 2002)
- RSF models are derived using empirical data as opposed to the expert opinion based HSI models

RSF MODEL

- RSF model derived using location data for short-horned lizards contained within the Fish and Wildlife Management Information System (FWMIS)
- Model consisted of 11 variables:
  - Distance to Badlands site type
  - Distance to Loamy site type
  - Distance to native upland
  - Distance to riparian areas
  - Distance to fluvial deposits
  - Percent non-vegetation cover
  - Percent grass cover
  - Percent shrub cover
  - Elevation
  - Aspect (northness and eastness)

* 7 Variables (in red type) were derived from the GVI dataset

FINAL RSF SURFACE WITH FWMIS POINTS



CONCLUSIONS

- Wildlife species select for very specific habitat features, which are not available in coarser datasets
- The Resource Selection Function model, using GVI, was better at predicting potential short-horned lizard habitat than the original Habitat Suitability Index (HSI) model
- GVI dataset allowed for an increased number of variables in the model and a finer spatial resolution
- The RSF modeling approach improves the performance of models over the HSI approach and provides a better suite of tools to government and conservation organizations to help conserve species at risk

REFERENCES

- Manly, B.F., McDonald, L.L, D.L. Thomas, T.L. McDonald, and W.P. Erickson. 2002. Resource Selection by Animals: Statistical Design and Analysis for Field Studies. Second Edition. Kluwer Academic Publishers. New York, NY. 221 pp.
- Morrison, M.L. 2002. Wildlife Restoration: Techniques for habitat analysis and animal monitoring. Island Press. Washington, DC. 209 pp. U.S. Fish and Wildlife Service. 1995. North Dakota's federally listed endangered, threatened, and candidate species 1995.